

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A ring type integrated starter/generator, comprising:
a ring shaped stator having a stator axis;
a ring shaped rotor having a rotor axis; and
an engine or water pump;
wherein

said stator is mounted on an engine body or a housing of a flywheel of said engine or on a housing of said water pump, said rotor is mounted on said flywheel of said engine or on a impeller of said water pump so that the stator axis is aligned with the rotor axis, said stator axially faces said rotor in the direction of the stator axis and the rotor axis, and said starter/generator further comprises a set of large current-conversion controller with low power consumption, which includes a control circuitry and a MOSFET grid-drive circuitry.

2. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein said engine flywheel is mounted on an engine crankshaft through an unidirectional clutch, a permanent magnet coupling and a reset spring, an electro-magnetic control solenoid is provided on an end face of said stator, and said unidirectional clutch achieves the engagement and disengagement under the action of a like-polarity repelling force between said electromagnetic control solenoid and said permanent magnet coupling; and, two end faces of said flywheel are provided with bearings respectively, seats of said bearings are mounted respectively on a pressure relief disk provided in an inner circumference of said stator and on a fixing disk provided on an outer end face of said flywheel, and said fixing disk is secured to said engine crankshaft through flywheel fastening bolts.

3. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein cooling water paths are provided either in said water pump housing or in said stator.

4. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein said stator comprises a ring shaped stator core, a fixing base plate, a clearance adjusting shim and a stator winding, said stator winding being wound on said stator core, said stator core being secured on an upper surface of said base plate through fixing holes, and said clearance adjusting shim being mounted on a lower surface of said base plate through installation openings; said rotor comprises a plurality of permanent magnets with positioning holes, which are disposed alternately with N-S poles in turn in a special mold to be pressure cast with aluminum alloy and then completed by magnetization; and, said stator and said rotor of such construction constitutes a permanent magnet starter/generator of side ring type.

5. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein said stator comprises a ring shaped stator core, a fixing base plate, a clearance adjusting shim and a stator winding, said stator winding being wound on said stator core, said stator core being secured on an upper surface of said base plate through fixing holes, and said clearance adjusting shim being mounted on a lower surface of said base plate through installation openings; said rotor comprises a rotor winding constituted of a circular inner conductive ring, a circular outer conductive ring and a plurality of conductive bars connecting the two conductive rings, one or a plurality of said windings being pressure cast with aluminum alloy or injection molded with plastics in a special mold to form a rotor; and, said stator and said rotor of such construction constitutes an induction starter/generator of side ring type.

6. (Canceled)

7. (Canceled)

8. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein said stator comprises a fixing base plate, a clearance adjusting shim, two ring shaped stator core with different diameters and two windings, said two stator cores and two windings being fixed on an upper surface of said base plate, which are injection molded with plastics to form a fully enclosed multiple-parallel stator of side ring type; said rotor comprises two sets of pluralities of permanent magnets with positioning holes, which are disposed alternately with N-S

poles in turn in a special mold to be pressure cast with aluminum alloy to form a multiple-parallel permanent magnet rotor; and said stator and said rotor of such construction constitutes a multiple-parallel permanent magnet starter/generator of side ring type.

9. (Currently Amended) A ring type integrated starter/generator as defined in claim 1, wherein said stator has windings of plural slots, plural poles, single-layered, chain-type and 3-phase, which are integrally assembled and injection molded with plastics to constitute said ring shaped stator; said rotor is a ring shaped permanent magnet rotor fabricated from plural Nd-Fe-B permanent magnets by casting of aluminum alloy and magnetization; and, said stator and said rotor of such construction constitutes a permanent magnet starter/generator of side ring type.

10. (Canceled)

11. (Currently Amended) A ring type integrated starter/generator, comprising:

- a ring shaped stator;
- a ring shaped rotor;
- an engine or water pump;

wherein said stator is mounted on an engine body or a housing of a flywheel of said engine or on a housing of said water pump, said rotor is mounted on said flywheel of said engine or on a impeller of said water pump, said stator faces said rotor, and said starter/generator further comprises a set of large current-conversion controller with low power consumption, which includes a control circuitry and a MOSFET grid-drive circuitry; and

wherein said engine flywheel is mounted on an engine crankshaft through an unidirectional clutch, a permanent magnet coupling and a reset spring, an electro-magnetic control solenoid is provided on an end face of said stator, and said unidirectional clutch achieves the engagement and disengagement under the action of a like-polarity repelling force between said electromagnetic control solenoid and said permanent magnet coupling; and, two end faces of said flywheel are provided with bearings respectively, seats of said bearings are mounted respectively on a pressure relief disk provided in an inner circumference of said stator and on a

fixing disk provided on an outer end face of said flywheel, and said fixing disk is secured to said engine crankshaft through flywheel fastening bolts.

12. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein cooling water paths are provided either in said water pump housing or in said stator.

13. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator comprises a ring shaped stator core, a fixing base plate, a clearance adjusting shim and a stator winding, said stator winding being wound on said stator core, said stator core being secured on an upper surface of said base plate through fixing holes, and said clearance adjusting shim being mounted on a lower surface of said base plate through installation openings; said rotor comprises a plurality of permanent magnets with positioning holes, which are disposed alternately with N-S poles in turn in a special mold to be pressure cast with aluminum alloy and then completed by magnetization; and, said stator and said rotor of such construction constitutes a permanent magnet starter/generator of side ring type.

14. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator comprises a ring shaped stator core, a fixing base plate, a clearance adjusting shim and a stator winding, said stator winding being wound on said stator core, said stator core being secured on an upper surface of said base plate through fixing holes, and said clearance adjusting shim being mounted on a lower surface of said base plate through installation openings; said rotor comprises a rotor winding constituted of a circular inner conductive ring, a circular outer conductive ring and a plurality of conductive bars connecting the two conductive rings, one or a plurality of said windings being pressure cast with aluminum alloy or injection molded with plastics in a special mold to form a rotor; and, said stator and said rotor of such construction constitutes an induction starter/generator of side ring type.

15. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator is composed of a ring shaped stator core fabricated by lamination and stamping of silicon steel sheets and a winding via wire embedding and injection molding, slots for embedding wire being provided on an inner circumference of said stator core; said rotor

comprises a plurality of pairs of permanent magnets, which are fixed alternately with N-S poles in turn on an outer circumference of a ring shaped magneto-conductive core; and, said stator and said rotor of such construction constitutes an induction starter/generator of inner ring type.

16. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator comprises a ring shaped stator core, a fixing base plate, a clearance adjusting shim and a stator winding, said stator winding being wound on said stator core, said stator core being secured on an upper surface of said base plate through fixing holes, and said clearance adjusting shim being mounted on a lower surface of said base plate through installation openings; said rotor comprises two conductive rings of same diameter and a plurality of conductive bars connecting the two rings to form a rotor winding, said rotor winding being pressure cast with aluminum alloy in a special mold to form an induction rotor of inner ring type; and, said stator and said rotor of such construction constitutes an induction starter/generator of inner ring type.

17. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator comprises a fixing base plate, a clearance adjusting shim, two ring shaped stator core with different diameters and two windings, said two stator cores and two windings being fixed on an upper surface of said base plate, which are injection molded with plastics to form a fully enclosed multiple-parallel stator of side ring type; said rotor comprises two sets of pluralities of permanent magnets with positioning holes, which are disposed alternately with N-S poles in turn in a special mold to be pressure cast with aluminum alloy to form a multiple-parallel permanent magnet rotor; and said stator and said rotor of such construction constitutes a multiple-parallel permanent magnet starter/generator of side ring type.

18. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator has windings of plural slots, plural poles, single-layered, chain-type and 3-phase, which are integrally assembled and injection molded with plastics to constitute said ring shaped stator; said rotor is a ring shaped permanent magnet rotor fabricated from plural Nd-Fe-B

permanent magnets by casting of aluminum alloy and magnetization; and, said stator and said rotor of such construction constitutes a permanent magnet starter/generator of side ring type.

19. (Currently Amended) A ring type integrated starter/generator as defined in claim 11, wherein said stator is mounted on an end face of said pump housing; said rotor is a brushless rotor comprising 6 S-polarity cores and 6 N-polarity cores that are welded up by aluminum alloy to form a 12-pole U-shaped rotor magneto-conductive core, said U-shaped rotor magneto-conductive core being mounted on an end face of said pump impeller corresponding to said stator, an exciting winding of rotor being wound on an outer housing of a pump bearing provided within said U-shaped rotor magneto-conductive core; and, said stator and said rotor of such construction constitute a brushless exciting induction water pump starter/generator of inner ring type.